Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

JUN 19 1996

In the Matter of	)	
	)	
Amendment of Parts 2 and 15 of the	)	ET Docket No. 96-8
Commission's Rules Regarding Spread	)	RM-8435, RM-8608, RM-8609
Spectrum Transmitters	)	

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COMMENTS OF THE PART 15 COALITION

The Part 15 Coalition ("the Coalition") submits these comments in response to the Notice of Proposed Rulemaking ("NPRM") in the above-referenced proceeding. The Coalition represents a group of companies that manufacture and market radio technologies designed to operate on an unlicensed basis in compliance with the Commission's Part 15 rules.

In the NPRM, the Commission has again recognized the importance of unlicensed spread spectrum technologies operating under Part 15. Today, spread spectrum technologies are providing a broad range of products and services to the public. The success of unlicensed radio can be attributed, in large measure, to the leadership the Commission has provided in creating a regulatory environment hospitable to these technologies. The Commission has a long tradition of preserving spectrum for unlicensed use and of building flexibility into its rules to promote the widest possible range of uses for Part 15 technologies.

The changes proposed in the NPRM continue the tradition. To help expand the range of services that may be provided using spread spectrum technologies, the Commission has proposed a number of modifications to its Part 2 and Part 15 rules. For example, the Commission has proposed eliminating the limit on antenna gain for spread spectrum systems operating in the 5725-5850 MHz band and reducing the number of hopping channels required to be used by frequency hopping technologies in the 902-928 MHz band. These and the other changes proposed by the Commission hold great promise for the future of unlicensed technologies. For this reason, subject to the modifications suggested below, the Coalition generally supports the changes proposed in the NPRM.

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DISCUSSION

I. The Commission Should Eliminate The Antenna Directional Gain Limit For Spread Spectrum Systems Operating In The 2.4 GHz and 5.8 GHz Part 15 Bands.

In the NPRM, the Commission has proposed to eliminate the antenna gain limit on non-consumer, fixed, point-to-point spread spectrum technologies operating in the 5.8 GHz band.[1] The Commission notes that the proposed elimination will allow unlicensed technologies to establish longer distance links in this band, which will be useful in a wide variety of applications, including emergency restoration of radio communications in disaster situations. For the reasons set forth in the NPRM, and in the petition of Western Multiplex Corporation on which the proposal is based, the Coalition supports this proposal. Several issues raised by the Commission with regard to the proposed change, however, require clarification or modification.

A. The Antenna Gain Exemption Should Extend To Part 15 Technologies Operating In The 2400-2483.5 MHz Band.

The Coalition disagrees with the Commission's tentative conclusion that it should not extend the antenna gain exemption to systems operating in the 2.4 GHz band. The principal reason cited by the Commission for excluding from the exemption the 2.4 GHz Part 15 band is the possible threat of interference from Part 15 technologies using high gain antennas, which focus transmission in a narrow beam, to other systems. The "potential" for interference from spread spectrum technologies using narrow beam antennas, however, actually is quite small.

To begin with, Technologies operating in the 2.4 GHz band are designed to be extremely robust in the face of interfering signals because the radio environment in this band is not coordinated. Indeed, the Commission's creation of unlicensed radio bands has caused designers and manufacturers of Part 15 technologies to rethink the very meaning of "interference." The traditional approach has been to design systems that are intended to prevent interference at the radio physical layer. The

[1] Although the Coalition agrees that the antenna gain restriction should be lifted only for non-consumer technologies and only for point-to-point operations, the Commission should clarify that, by limiting the removal of the restriction to "fixed, point-to-point" systems, it is referring to the radio transmission of the systems and not to the systems themselves. That is, "relocatable" spread spectrum systems should qualify for the exemption from the antenna gain limitation so long as they transmit only between two "fixed" points at whatever location they are operating.

new approach is to expect interference at the physical layer, but to mitigate and work-through that "interference" with technologies applied at the link and routing layers of the system such as coding gain, digital processing and spread spectrum transmission.

The use of narrow beam antennas is another method of enhancing the ability of unlicensed radio technologies to share spectrum in an uncoordinated radio environment. The higher the antenna gain, the higher the frequency reuse in a given area. Thus, although the potential interference to radio systems in the beam of the directional antenna may be increased, the probability of such overlapping signals is decreased. Field experience amply confirms this conclusion. Neither Western Multiplex nor Cylink, which already operate over a thousand devices in the field at 2.4 GHz with narrow beam directional antennas pursuant to an FCC waiver, has had a single complaint of interference.

In fact, the most significant interference threat in the 2.4 GHz band is not from Part 15 transmissions, but from Part 18 ISM equipment, including microwave ovens, which generate broad band interference and have no radiated power limits.[2] This interference is expected to increase as new industrial lighting systems and other new high-powered ISM applications, which generate high levels of radio "noise" in the 2.4 GHz band, become more prevalent.[3]

The use of narrow beam antennas by Part 15 technologies will help to reduce the interference threat posed by these Part 18 ISM devices. Because systems using directional antennas have vastly increased data through-put performance (per unit bandwidth, per unit area), system reliability in the face of interfering radio noise is vastly improved. Thus, the use of narrow beam antennas by Part 15 technologies will not diminish, but enhance the ability of Part 15 and Part 18 systems to share the 2.4 GHz band.

High antenna gain spread spectrum systems in the 2.4 GHz band also will provide substantial public benefits. Elimination of the antenna gain restrictions for Part 15 technologies in the 2.4 GHz band will allow spread spectrum systems to increase their operational range from approximately 8 km to approximately 48 km.

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[2] Report to Ronald H. Brown, Secretary, U.S. Department of Commerce, Regarding the Preliminary Spectrum Reallocation Report ¶ 50 (rel. Aug. 9, 1994).

[3] Id. ¶ 38.

At this range, spread spectrum part 15 technologies offer practical communications solutions for a variety of public interest consumer, business, and government needs.

In this regard, eliminating the antenna gain restriction at 2.4 GHz would be consonant with the Telecommunications Act of 1996. Section 706 of the 1996 Act requires the Commission to encourage the development and deployment of advanced telecommunications capability to all Americans (including, in particular, schools). As Commissioner Ness noted in her separate statement in the Commission's Notice of Proposed Rulemaking on the establishment of an "NII/SuperNET" band, which would also be used by Part 15 devices: "Low-power radio technology can serve as a low-cost, high-bandwidth, on-ramp to the Information Superhighway for the leaders and workers of tomorrow. Such an application would be directly responsive to the wishes of Congress, as reflected in ... Section 706 of the [1996 Act]."[4]

B. No Corresponding Reduction In Power Output Is Necessary For Part 15 Technologies Using Narrow Beam Antennas.

For many of the same reasons previously discussed, the proposed reduction in output power of 1 dB for each 3 dB that antenna gain exceeds 6 dBi and the proposed limits on horizontal and vertical beamwidths are unnecessary. There simply is no basis at this time to assume that interference from these operations will be real or significant enough to justify Commission micromanagement of technologies demanded by the marketplace. At this stage, the Commission should assume that Part 15 spread spectrum technologies will continue to share spectrum in the robust and efficient manner that they always have. Indeed, the spectrum bands in which ISM devices operate, such as the 2.4 GHz band, are ideal for the development of technically advanced products due to the uncontrolled radio environment. Until there is evidence to the contrary, unnecessary limits on the design of Part 15 systems should be avoided.

C. The Grantee Of Equipment Certification Should Be Responsible For Ensuring Compliance With The ANSI/IEEE RF Hazards Standard.

The Commission has asked in the NPRM for comment regarding the possible public health concerns raised by the use of systems employing high effective

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[4] In re Amendment of the Commission's Rules to Provide for Unlicensed NII/SuperNET Operations in the 5 GHz Frequency Range, ET-96-102 (rel. May 6, 1996) (separate statement of Commissioner Ness).

radiated power levels. Given the restrictions proposed for narrow beam spread spectrum technologies (*e.g.*, non-consumer, fixed, point-to-point systems only), the Coalition believes that there is little threat that these systems will pose a significant health hazard and, in fact, that such systems will pose less of a health risk than many other radio devices, including cellular telephones. Nonetheless, the Coalition agrees with the Commission's conclusion that the grantee of certification should be responsible for ensuring that the equipment is designed to minimize the exposure of the public to excessive radio frequency signal levels. With regard to the standards to be used in measuring this exposure, the Coalition has explained elsewhere its support for the ANSI/IEEE RF hazards standard, as proposed by the FCC, in lieu of the standards suggested by the National Council on Radiation Protection and Measurements.[5]

D. The Commission Should Prohibit Cross-Border Transmissions By Part 15 Technologies Using Narrow Beam Antennas.

The Coalition strongly opposes the Commission's proposal to "limit operation [of narrow beam Part 15 technologies] near the Canadian and Mexican borders to avoid unauthorized cross-border operations and interference to licensed systems in Canada and Mexico."[6] Any such limitation would unfairly and unnecessarily limit legitimate uses of Part 15 technologies near the U.S. borders.

As an alternative, the Coalition suggests that the Commission prohibit the use of narrow beam Part 15 systems for radio links that cross either the Canadian or Mexican border. This approach would increase the level of protection for foreign operations by allowing users to direct system transmissions within the U.S. while imposing less of a burden on legitimate domestic Part 15 operations. In addition, the Coalition's proposed alternative would facilitate compliance because, rather than having to determine distance from the border, Part 15 operators merely would be required to ensure that the point to which they were transmitting is not in either Canada or Mexico.

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[5] See Guidelines for Evaluating the Environmental Effects of RF Radiation, ET Docket No. 93-62, Letter from Henrietta Wright, Counsel to the Part 15 Coalition, to Chairman Reed Hundt (May 6, 1996).

[6] NPRM ¶ 15.

II. The Coalition Supports The Commission's Proposal To Reduce The Number Of Frequency Hopping Channels.

In the NPRM, the Commission has proposed reducing the number of frequency hopping channels required under Section 15.247(a)(1)(i) from 50 to 25 for frequency hopping spread spectrum systems operating in the 902-928 MHz band, provided that those systems employ hopping channel bandwidths of at least 250 kHz and the maximum authorized transmitter power for frequency hopping devices using fewer than 50 channels is reduced to 500 mW The Coalition generally supports the proposed rule changes. By reducing the number of hopping channels required of frequency hopping systems, the Commission will help to reduce the spectrum occupancy of Part 15 frequency hopping devices and thereby maximize spectrum efficiency in the increasingly congested 902-928 MHz band.

III. The Coalition Generally Supports the Commission's Additional Proposals.

The Commission has proposed a number of additional rule changes in the NPRM, designed to clarify existing rules and codify existing policies. The Coalition generally supports these common sense changes

For instance, the Commission has proposed in paragraph 44 adding a new section to the Part 15 rules that would prohibit the manufacture, importation, marketing, and use of external radio frequency power amplifiers intended for use with Part 15 transmitters that are not certified as part of a Part 15 system. The Coalition only advocates the lawful and responsible use of Part 15 devices. All such devices should be manufactured and sold in strict compliance with the Commission's rules. In an environment in which the spectrum resource must be shared, there simply is no room for those who refuse to abide by the Commission's spectrum management rules.

Similarly, the Coalition supports the proposals in paragraphs 41, 42, and 43 of the NPRM. The measurement procedures outlined in paragraph 41 would codify the current informal standard, which has so far proven to be manageable and reliable; the rule consolidation and clarification described in paragraph 42 is fully warranted; and the rule change to allow "intelligent" frequency hopping technologies will allow for vast improvements in Part 15 systems and thus open a new range of applications for these systems. The Coalition applauds the Commission's efforts on each of these issues.

IV. The Outcome Of This Proceeding Should Not Be Subject To Change Based On Any Action On Reconsideration In The LMS Proceeding.

The NPRM suggests that changes made to the rules applicable to Location and Monitoring Services ("LMS") on reconsideration in the LMS proceeding may "result in modifications to changes for the spread spectrum regulations under Part 15" in this proceeding.[7] The LMS proceeding is concerned with the creation of a new service within an existing Part 15 band. The rules adopted in the proceeding are intended to facilitate the sharing of that band, but they do not include changes to the Part 15 rules *per se*. Thus, changes made in the LMS proceeding to the LMS rules are outside of the scope of the Part 15 rule changes proposed in this proceeding. If, upon reconsideration, the LMS rules are changed in ways that require further modification to the Part 15 rules, the Commission should initiate a new Part 15 proceeding and subject any such proposed modifications to public review and comment in accordance with the Administrative Procedure Act.

CONCLUSION

With the modifications and clarifications described above, the Coalition generally supports the rule changes proposed by the Commission in the NPRM.

Respectfully submitted,

THE PART 15 COALITION

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[7] NPRM ¶ 34.